May 6, 2019

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W:
Washington, D.C. 20554

Re: Expanding Flexible Use of the 3.7 to 4.2 GHz Band
GN Docket No. 18-122
***Ex Parte* Filing Notice**

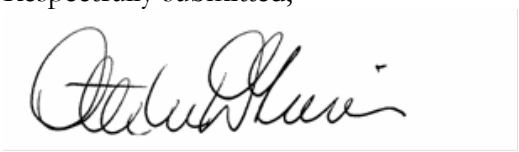
Dear Ms. Dortch,

I am counsel to PSSI Global, L.L.C. ("PSSI") in connection with matters related to GN Docket No. 18-122 (the "C-band Proceeding"). Pursuant to Section 1.1206(b)(2) of the Commission's Rules[1], I am filing a copy of a letter from Mr. Robert C. Lamb, CEO of PSSI, addressed to Chairman Pai, with copies to the other Commissioners.

The letter addresses continuing concerns of PSSI regarding technical problems that would result from a repurposing of a portion of the band for terrestrial mobile use. The letter includes a report prepared by A.J. Miceli, PSSI's Vice President, Satcom Division, that addresses concerns of the transportable community of C-band users regarding filtering solutions proposed by the C-Band Alliance ("CBA"). The report concludes that although the filtering solutions proposed by CBA can mitigate interference to FSS operators at fixed locations that would be caused by 5G terrestrial mobile service in the lower C-band, the filtering proposal does not yet provide any reasonable protection from such interference for the C-band transportable users such as PSSI.

Pursuant to Section 1.1206(b)(2) of the Rules, an electronic copy of this letter is being filed in the above-referenced docket, with a copy to the Chairman and the other Commissioners. Please direct any questions regarding this filing to me at stephen.diaz.gavin@rimonlaw.com or at 202-871-3772.

Respectfully submitted,



Stephen Díaz Gavin

Attachment

cc: The Commissioners

[1] 47 CFR § 1.1206

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May 2, 2019

The Honorable Ajit Pai
Chairman
Federal Communications Commission
445 12th Street, N.W.
Washington, D.C. 20445

Re: Repurposing of C-Band Spectrum
WT Docket No. 18-122

Dear Mr. Chairman,

As stated in our comments and ex parte filings in this C-band proceeding, PSSI Global Services ("PSSI") supports the C-band Alliance (CBA) spectrum repurposing proposal (with some caveats as previously noted), if only because it is the sole proposal offering any reasonable answer to facilitating and managing the critical need for shared C-band spectrum fixed network FSS use. After having analyzed the CBA testing and conducting our own continuing research, we have concluded that fixed network FSS users can most likely be accommodated in the CBA plan via a combination of 5G transmitter power limitation guidelines and regulations, and earth station C-band (in-band and out-of-band) filtering. Unfortunately, PSSI's analysis has also concluded that the CBA proposal does not yet provide any reasonable protection for the C-band transportable users such as PSSI that support all of the transportable C-band needs of our network, cable, and other customers.

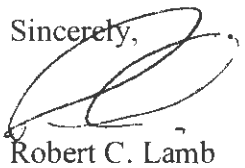
Attached is an engineering report from A.J Miceli, Vice President of PSSI's Satcom Division, which discusses this issue in depth, including the results of the April 3, 2019 demonstration by the CBA of 5G filter testing at the Intelsat headquarters in Ellenwood, Georgia. At that demonstration, we were able to evaluate in a lab environment the use of 5G signals within the C-band downlink 4GHz spectrum.

Unlike FSS earth stations, which are tied to fixed latitude and longitude locations, no proposal (including that of the CBA) has made any consideration for the mobile uplink/downlink community where there are currently no effective provisions to protect any mobile antenna systems from 5G interference. No protections suggested by the CBA apply to mobile uplink/downlink use, nor have any other entities addressed these threats to the transportable industry.

While we intend to continue testing the proposed CBA filters and 5G, we are concerned that neither the suggested filters nor any other technical solution can be effective to protect the use of C-band transportable earth stations.

Nevertheless, we are hopeful that these deleterious effects to our business can be mitigated and, if not, that the FCC understands the devastating economic impact this decision will have to the C-band transportable uplink community and for high quality, live events programming.

Sincerely,



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Report of A.J. Miceli Regarding CBA Filtering Proposal

1. I am A.J. Miceli, Vice President, Satcom Division, of PSSI Global, L.L.C. (PSSI). I have held this responsibility since 2016, when PSSI acquired my previous employer, Satcom Scientific.

2. In my current position, I oversee PSSI's East Coast maintenance department and manage the fabrication, installation, integration, testing and documentation of all of PSSI's satellite operation assets, specifically including all of the company's C-band antenna vehicles and equipment.

3. I am the person at PSSI responsible for review and analysis of the proposals made to the Federal Communications Commission and satellite users by the C-Band Alliance (CBA) to minimize the interference to C-band operations that would be caused by introduction of 5G mobile service in the lower 200 MHz portion of the frequency band. The CBA plan proposes using filters to protect remaining users of the C-band from high power 5G signals in the lower 200 MHz of the C-band that would be repurposed.

4. Based upon (a) my review of the documentation provided to PSSI by CBA, (b) observation of the tests and demonstrations of filtering solutions conducted by CBA at INTELSAT headquarters in Ellenwood, Georgia and (c) discussions with INTELSAT staff, I have concluded that the current filtering solutions proposed by the CBA are not and cannot be effective in be effective in protecting transportable C-band earth stations from 5G mobile interference if terrestrial mobile service is allowed in the lower 200 MHz of the C-band.

Background and Experience

5. My professional experience and credentials are as follows. After several years working in and receiving radio frequency training in the U.S. Navy and later work for several firms in the satellite filed, I joined RF Scientific in 1984. There I served as vice president and later president of the company, handling tasks that included operating transportable earth stations for major broadcast networks, managing the company's metal fabrication facilities, and engineering vehicles, antennas and transmission systems. In 2006, I played an integral role in RF Scientific's rebranding as Satcom Scientific and, as president, continued to lead the company in the prototype development of satellite communications systems.

6. In 2006, I formed the government systems division of Satcom Scientific. During this time, I spent the majority of my time testing and qualifying solid-state amplifiers, antennas and modems used in military satellite communications systems.

7. My contributions to the industry have been recognized. In 1991, I received a technical Emmy from the Television Academy of Arts and Sciences for designing the first "digital video on the move" vehicle which was used on the front lines by NBC news during the first Gulf War.

8. In addition to my work with Satcom and PSSI, I also spent 18 months as a contractor and advisor to NASA and Jet Propulsion Laboratory for the Voyager II spacecraft encounter with the plant Neptune

Interference Measures Proposed by the CBA

9. The CBA has proposed to the FCC that 200 MHz of the spectrum band from 3700 MHz to 3900 MHz be vacated by existing satellite users to accommodate 5G operations of terrestrial mobile carriers. The lower 180 MHz of this portion of the spectrum band would be the operational bandwidth used for 5G mobile operations and the uppermost 20 MHz would be established as a guard band. Under the CBA proposal, the maximum power spectral density (PSD) levels associated with the 5G base stations would be confined to 1,640 watts/MHz (62 dBm/MHz) in urban areas and 3,280 watts/MHz (65 dBm/MHz) in rural areas.

10. To account for the 5G operations at these power levels, the CBA is proposing several measures to protect the remaining 300 MHz of the C-band downlink spectrum from interference caused by the operation of 5G in the lower section of the band. These protections would apply to all FSS earth stations that are registered with the FCC. The protections for existing users proposed by CBA include:

- All antennas within 150 meters of the registered FSS location having a diameter of 3 meters to 13 meters and an elevation of 5 degrees or more would be protected in the entire frequency spectrum of 3900 – 4200 MHz.

- Each 5G base station within 40 kilometers of a registered FSS earth station must limit its aggregate power density level in the band of 3700 – 3900 MHz to no greater than -81.6 dBm/MHz at the input of the earth station low-noise block downconverter (LNB). This level will be calculated by the 5G licensee.

- Each 5G base station within 40 kilometers of a registered FSS earth station must limit its aggregate power density level in the band of 3900 – 4200 MHz to no greater than -128 dBm/MHz at the input of the earth station LNB. This level will be calculated by the 5G licensee.

- In order to meet these power levels at the input of the LNB, a special filter for each C-band downlink port of all registered antennas would be provided by the CBA that will reject at least 43 dB of all 5G emissions in the 3880 – 4200 MHz band. The CBA model shows that the filter would provide 100 dB (appx) of rejection from 3700 – 3880 MHz.

11. On April 3, 2019, the CBA conducted a live 5G filter testing demonstration at the INTELSAT headquarters in Ellenwood, Georgia. I attended on behalf of PSSI.

12. The CBA demonstration was conducted in a lab environment. The lab setup is well documented in the "*C-band Alliance Technical Proposal for 5G Operations Adjacent to C-band Satellite Services and Test Results*" prepared by Steve Corda of SES and Salim Yaghmour of Intelsat. The demonstration was held in a classroom environment where the test equipment was being remotely controlled, and then we were shown the actual lab setup where further discussions and demonstrations questions were conducted.

13. CBA did a downlink of a QVC video signal from Galaxy 3C Transponder 11 using one of the antennas at Ellenwood. Transponder 11 was chosen because the center frequency of that transponder is 3920 MHz, which would be the closest transponder frequency to the upper end of the portion of the band proposed to be repurposed for 5G and thus most likely to be subject to interference. The QVC L-band signal was then fed to one input of an L-band combiner. The other L-band combiner input was fed by a 5G test generator that included a 5G compliant waveform

and a base station filter having the mask proposed by the CBA, which was then frequency translated to L-band. The output of the combiner was fed first to an LNB having no 5G filter and then switched to an LNB having a 5G filter. I witnessed the effects of the 5G interference to the QVC signal as the moderator raised the 5G signal from nothing to a level of above 43dBm. The filter was very effective at mitigating the effects of the 5G signal within the 3900 – 4200 MHz spectrum.

Issues with the CBA Proposed Solution

14. Nevertheless, although the CBA document described this as an OTA (Over the Air) test, the 5G emission signal was injected in the lab and not into the face of the antenna downlinking the QVC signal. I brought this to the attention of the moderator who informed me that the signal levels used in these tests took the passive gain of the antenna into consideration when determining the test levels. Nevertheless, I still question the possibility of passive intermodulation issues when considering a high power OFDM 5G signal is entering the face of the antenna, before the filter and the LNB. Page 10 of the "*C-band Alliance Technical Proposal for 5G Operations Adjacent to C-band Satellite Services and Test Results*" document shows the acceptable levels, but this actual test was not demonstrated during this session because it would have interfered with all of the antennas at Ellenwood.

Conclusions

15. If all the FSS protections and 5G Parameters proposed by the CBA would be mandated and strictly enforced, then the addition of the 5G filters proposed by the CBA would allow the 5G operators and the FSS C-band downlink community to co-exist within the 3700 – 4200 frequency band.

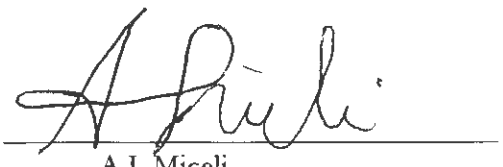
16. This solution, however, has several shortcomings. For example, at present it is uncertain who would monitor the activity of the 5G community with respect to the power levels suggested by the CBA and compliance with the parameters. Page 9 of the "*C-band Alliance Technical Proposal for 5G Operations Adjacent to C-band Satellite Services and Test Results*" document states that the 5G licensee must comply with the with the LNB saturation rule. However, how this would occur and who would oversee the locations and power levels of the base stations is unclear. [If the FCC decides to adopt the CBA plan, the FCC should incorporate the operational limits for 5G mobile operators and filtering requirements into the FCC Rules and, therefore, make such matters subject to FCC enforcement.].

17. Moreover, the CBA plan excludes a significant number of users of the C-band, including transportable companies like PSSI. Unlike the FSS earth stations, which are tied to a fixed latitude and longitude, the CBA proposal into consideration the needs of the mobile uplink community. There are currently no provisions to protect any mobile antenna systems from 5G interference. None of the protections suggested by the CBA apply to the mobile uplink/downlink community. Most sports events as well as live news and public safety events that are uplinked using registered and licensed transportable earth stations emanate from heavily populated urban areas where the 5G emissions could be as high as +62 dBm/MHz.

18. It is my professional judgment that permanent damage can and will occur to any C-band LNB where the LNB input level is greater than -50dBm. There is no filter that can be used on any of the PSSI transportable earth stations that would provide enough rejection of 5G interference in urban areas. As an example, the input power of an LNB coming from a satellite having a 40dB EIRP towards earth would be about -150 dB. That is 1x10^16 of a watt. It is likely that 5G power levels at any location in an urban area would exceed this level and could cause catastrophic failure of the LNB as soon as it is powered on.

19. I also question how the 5G base stations would be frequency coordinated. Currently, PSSI and all other mobile uplink/downlink companies must conduct a frequency coordination study to prevent from interfering with existing operators in the 6 GHz bandwidth. The 4G frequencies currently used by mobile telephone operators do not interfere with the mobile uplink/downlink community prior to 5G and we did not have to concern ourselves with coordinating those 4G cell sites. If the FCC adopts the CBA proposal to repurpose 200 MHz of the C-band, then we will need a means to identify those 5G base station locations and the power levels we would experience at the site of our transmissions.

Dated: May 3, 2019



A.J. Miceli